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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,454	03/30/2004	Yasushi Saito	7217/71977	4691

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EXAMINER
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NORTON, JENNIFER L

ART UNIT	PAPER NUMBER
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2121

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/813,454	<b>Applicant(s)</b> SAITO, YASUSHI	
	<b>Examiner</b> Jennifer L. Norton	<b>Art Unit</b> 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The following is a **Final Office Action** in response to the Amendment received on 30 June 2006. Claims 1 and 4 have been amended. Claims 2 and 5 have been cancelled. Claims 1, 3, 4 and 6 are pending in this application.

### ***Drawings***

2. The amendment to the Drawings was received on 30 June 2006. The corrections are acceptable and the objections are withdrawn.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,204,988 (hereinafter Codilian) in view of U.S. Patent No. 5,331,299 (hereinafter Smith) in further view of U.S. Patent No. 5,602,896 (hereinafter Diepstraten).

5. As per claim 1, Codilian teaches to an automatic gain adjustment device of a feedback control system that uses a phase difference between an output signal

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obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment device comprising:

phase shifting means connected to an input stage of the feedback control system for shifting a phase of the input signal (col. 2, lines 18-55) such that a phase shift amount of the phase shifting means is set so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain of the feedback control system becomes 0 db (col. 1, lines 54-67, col. 2, lines 1-17 and col. 7, lines 24-30);

Codilian does not expressly teach a multiplier for multiplying the input signal and the output signal obtained from the controlled object;

an integrator for integrating product results of the multiplier and outputting integrated product results; and

a gain setting unit for adjusting a gain of the feedback control system based on a sign of the integrated product results from the integrator so that the open loop gain converges to 0 dB.

Smith teaches to a multiplier for multiplying the input signal and the output signal obtained from the controlled object (col. 4, lines 54-57 and Fig. 1, element 38); and

an integrator for integrating product results of the multiplier and outputting integrated product results (col. 4, lines 64-67 and Fig. 1, element 40).

Smith does not expressly teach a gain setting unit for adjusting a gain of the feedback control system based on a sign of the integrated product results from the integrator so that the open loop gain converges to 0 dB.

Diepstraten teaches to a gain setting unit (Fig. 2, element 40) for adjusting a gain of the feedback control system based on a sign (col. 4, lines 57-61 and col. 8, lines 58-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Codilian to include a multiplier for multiplying the input signal and the output signal obtained from the controlled object; an integrator for integrating product results of the multiplier and outputting integrated product results; and a gain setting unit for adjusting a gain of the feedback control system based on a sign for the advantage of reducing feedback of the DC component (Smith: col. 4, lines 67-69 and col. 5, lines 1-2) and the benefit of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (Diepstraten: col. 5, lines 18-23).

6. As per claim 3, Codilian and Smith do not expressly teach the open loop gain is converged to 0 dB using a bisection method.

Diepstraten teaches to the open loop gain is converged to 0 dB using a bisection method (col. 4, lines 57-62 and col. 8, lines 58-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Codilian in view of Smith to include the open loop gain is converged to 0 dB using a bisection method for the advantage of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (col. 5, lines 18-23).

7. As per claim 4, Codilian teaches to an automatic gain adjustment method for a feedback control system that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment method comprising the steps of:

setting a phase shift amount so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain of the feedback control system becomes 0 dB (col. 1, lines 54-67, col. 2, lines 1-17 and col. 7, lines 24-30);

shifting a phase of the input signal based on the phase shift amount set in said step of setting (col. 2, lines 18-55).

Codilian does not expressly teach multiplying the input signal and the output signal obtained from the controlled object;

integrating results of the step of multiplying; and

adjusting a gain of the feedback control system based on a sign of the integrated results so that the open loop gain converges to 0 dB.

Smith teaches to multiplying the input signal and the output signal obtained from the controlled object (col. 4, lines 54-57 and Fig. 1, element 38); and

integrating results of the step of multiplying (col. 4, lines 64-67 and Fig. 1, element 40).

Smith does not expressly teach adjusting a gain of the feedback control system based on a sign of the integrated results so that the open loop gain converges to 0 dB.

Diepstraten teaches to adjusting a gain of the feedback control system based on a sign (col. 4, lines 57-61 and col. 8, lines 58-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Codilian to include multiplying the input signal and the output signal obtained from the controlled object; integrating results of the step of multiplying and adjusting a gain of the feedback control system based on a sign for the advantage of reducing feedback of the DC component (Smith: col. 4, lines 67-69 and col. 5, lines 1-2) and the benefit of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (Diepstraten: col. 5, lines 18-23).

8. As per claim 6, Codilian and Smith do not expressly teach the open loop gain is converged to 0 dB using a bisection method.

Diepstraten teaches to the open loop gain is converged to 0 dB using a bisection method (col. 4, lines 57-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Codilian in view of Smith to include the open loop gain is converged to 0 dB using a bisection method for the advantage of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (col. 5, lines 18-23).



***Response to Arguments***

9. Applicant's arguments, see Remarks pgs. 5-6, filed on 30 June 2006, with respect to the rejection(s) of claims 1 and 4 under 35 U.S.C. 102(b) have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments, see Remarks pg. 6, filed on 30 June 2006, with respect to the rejection(s) of claims 3 and 6 under 35 U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

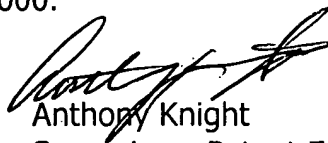
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m.- 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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Art Unit 2121